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ABSTRACT

Because the number of students seeking admission to colleges of veterinary medicine exceeds the number that can be admitted, and because the changes that characterize veterinary students today have important implications for veterinary educators and administrators, this study focused on characteristics of undergraduate pre-veterinary students attending land grant universities in the South. The adjusted sample included 245 students with a major in pre-veterinary medicine, 79 students with pre-veterinary medicine as a second or dual major, and 749 animal science majors (for comparison purposes). The profiles described students' personal characteristics: family background: high school, agricultural, and college experiences: career influences: goals: and selected attitudes. The study documented the increased number of women seeking admittance to the veterinary profession and broad acceptance of female participation in the profession. Many pre-veterinary students lacked farm and agricultural experience. Very few of them were black or of other minority groups. A vast majority of pre-veterinary students, regardless of sex, residence, or minority status, possessed largely positive attitudes toward agriculture and the agricultural industry. They were influenced in their choice of occupation and educational curriculum by their parents and the local veterinarian. (CM)

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PRE-VETERINARY STUDENTS IN AGRICULTURE AT SOUTHERN LAND-GRANT UNIVERSITIES

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Summary

Veterinary medical education is undergoing considerable expansion in the Southern States with the establishment of six new Colleges of Veterinary Medicine and an increased need for veterinarians in regions of greatest population growth. At the same time, composition of veterinary medical students includes more women and students from urban backgrounds. The number of students seeking admission to colleges of Veterinary Medicine continually exceeds the number that can be admitted. The changes that characterize veterinary students today have important implications for veterinary faculty and administrators.

The focus of this report is on undergraduate pre-veterinary students attending land-grant universities in the South. For comparison purposes profiles of animal science and all agriculture students are presented. The profiles describe students' personal characteristics, family backgrounds, experiences, career influences, goals, and selected attitudes. Findings revealed the heterogeneous composition of the pre-veterinary student group and provide a broad base for considering alternative approaches to several issues confronting those concerned about veterinary medical education.

PRE-VETERINARY STUDENTS IN AGRICULTURE AT SOUTHERN LAND-GRANT UNIVERSITIES

Veterinary medicine has a special appeal for many young people considering professional careers. It is a very visible career field for farm and rural youth who encounter the veterinarian at work in numerous roles associated with the production of livestock and poultry for human consumption. At the same time the veterinarian in small animal practice associated with the health care of family pets is familiar to many urban youth as well. Student enrollments in pre-veterinary and veterinary medicine programs are reflecting these two distinct sources of attraction to the profession.[1/]

The purpose of this report is to examine the background and goals of undergraduate students enrolled in pre-veterinary curricula at Southern land-grant universities in the U.S. The South is a particularly appropriate area for conducting such a study because it is currently undergoing a significant expansion of its veterinary education centers from five to ten schools.[2/] Moreover, all of these educational facilities are part of the land-grant college system and are located on campuses offering education in agriculture. Tuskegee Institute is the lone exception as a private college, but it is similar in that it too has a recognized undergraduate program in agriculture education and ties of long standing with both research and extension divisions of the U.S. Department of Agriculture.

Recognizing that pre-veterinary education is not limited either to land-grant universities or to curricula administered by colleges of agriculture, a majority of the applicants to veterinary schools in the South still receive their pre-professional training at land-grant universities. Our objective here is to profile in rather detailed fashion, selected attitudes and background characteristics of pre-veterinary majors in contrast to their fellow students in animal science and to all agriculture students. In three major parts, we address selected sets of concerns: What are the backgrounds of these students? What are their occupational goals and aspirations? and, What motivates them to seek careers in their chosen areas? These profiles are generalizable to all pre-veterinary and agriculture students at both 1862 (predominantly white) and 1890 (predominantly black) land-grant universities in the Southern region.[a/]

Perspective

Annually, hundreds of high school students request information about the opportunities and requirements for entering veterinary medicine.[3/] Motivated by a personal interest and affection for animals or by the encouragement offered by relatives, teachers, counselors or local veterinarian, they begin to explore career alternatives. Most youth lack any conception of how highly diversified the profession is as it strives to meet its responsibilities for the protection of animal and human health.[2/] The most visible veterinarians

are those in private practice. However, Morrison reports that in the mid-70's more than 40 percent of all veterinarians were employed in public health, regulatory, military, industrial, research, and teaching activities.[2] These less common veterinarian roles are seldom observed by the inquiring young person.

Once the decision has been made to pursue a career in veterinary medicine, the first step in progressing toward professional status is to enroll in a pre-veterinary college curriculum, or by including pre-veterinary as a second major within the basic curriculum. As the initial act of commitment to becoming a veterinarian, selection of the college or university at which the pre-veterinary program is undertaken has important consequences.[2]

Most colleges of veterinary medicine are located at land-grant universities offering curricula in agriculture. Swope maintains that pre-veterinary training in an agriculturally oriented program has inherent advantages over a strict liberal arts program.[3] Some of the perceived benefits include greater opportunity for students to become acquainted with the veterinary facilities on campus, to interact with veterinary faculty, to have access to courses relating to the health needs of animals, and to get involved in pre-vet clubs on campus.[4] None of these opportunities for anticipatory socialization are available to pre-veterinary students attending liberal arts colleges and universities. Although availability of such experiences does not guarantee eventual admission to a College of Veterinary Medicine, it can prove helpful.[2]

For several reasons, including low admission rates to schools of veterinary medicine and the need for a broad exposure to agriculture, the choice of an undergraduate pre-veterinary major is very important. It is particularly relevant to a concern within the profession over the small proportion of veterinary graduates entering "food--or economic--animal medicine" compared to "noneconomic-animal medicine."[5] With the increasing numbers of urban and women students entering the veterinary schools and ultimately the veterinary profession, [1],[2],[3],[6],[7],[8] the shortage of veterinarians in this area has serious import for maintaining a sufficient quantity of high quality food animals for human consumption. This has direct relevance to the counseling and advising of high school and college students seeking to enter the veterinary profession.

Blake and Shupe state that the counseling of pre-veterinary students presents real problems and challenges to the veterinary educator and to the profession as a whole.[9] The counseling challenge is in three areas: 1) to encourage students who exhibit ability, desire, scholarship, and aptitude for veterinary medicine; 2) to be knowledgeable concerning preprofessional requirements so that students are not misled; and 3) to redirect students not likely to gain acceptance to a veterinary school so that they can succeed in some other field with a minimum of disappointment, time loss, and confusion. Because of the structure of the professional schools, most veterinary faculty

are isolated from direct contact with these undergraduate students. However, this does not relieve the obligation of the veterinary profession and its professional schools to this student public for accurate and helpful career planning information.

Over the years, people in veterinary medical education have exhibited considerable concern for the pre-veterinary student.[9/,10/,11/] The number of students selecting a pre-veterinary curriculum at sometime in their undergraduate program is not known. However, Morrison reports that there are more than 13,000 who eventually apply annually (unadjusted for multiple applications) for fewer than 2,000 openings in Colleges of Veterinary Medicine.[2/] Nationally, acceptance rates some years have been as low as 15 percent of all qualified applicants. Projections made in the early 1970's indicated that acceptance rates might fall from 1 in 5 to a level as low as 1 in 10 during the 1980's in spite of the opening of new colleges of veterinary medicine.[8/,12/] More recent experience has contradicted these projections as applications have dropped from 12,000 in 1975 to only 9,500 in 1978.[13/] This decline has raised the admission rate to about 1 in 4.

The task of selecting the small group of students who will be allowed to pursue veterinary studies at the professional level is an awesome responsibility. Frank refers to the surplus of good students, even a diminished surplus, as a major challenge to the veterinary profession.[10/] There is a need to

provide pre-veterinary programs that will give students maximum opportunity to gain admission to the profession while simultaneously preparing those not selected with satisfying alternative careers.

Most schools of veterinary medicine currently require completion of 2 years of undergraduate work prior to admission. In reality, however, the period of pre-veterinary preparation usually extends to 3 or 4 years and even on into graduate school by students denied early admission.[1/,2/] One uniqueness of veterinary education is the students' lack of choice among professional schools.[11/] Because of the limited number of professional schools and of exclusionary admissions policies, students have very limited alternative opportunities for pursuing their career goals. Admissions are often limited to state residents or, as has been the case in the Southeast, to residents of a contract (or compact) state lacking its own school of veterinary medicine.[4/] Contract situations are usually based on having a quota of students from the contract state in each entering class.

As the decade of the 1980's began, veterinary educators and practitioners alike were concerned about the future of the profession. Whereas projections of employment opportunities had been excessively optimistic throughout the 1960's,[2,3/,8/] the picture began to cloud over in the past decade. As a result, in 1977, the American Veterinary Medical Association commissioned a manpower needs assessment.[15/] This study revealed that a balanced situation

existed nationally between the supply and demand for veterinarians. Anticipated entry rates for new members of the profession led to the projection that a 16% surplus could occur by 1990, if no expansion occurred on the demand side.[16/] This changed employment scenario is of considerable relevance to undergraduate pre-veterinary educators.

Procedures

Data were obtained from a survey of agriculture students at land-grant universities in 13 states comprising the Census South. Agriculture student enrollment lists for Spring 1977 were obtained for all 1862 and 1890 land-grant universities.[b/] The total undergraduate enrollment of 1890 agriculture students and a 15% random sample of 1862 agriculture students stratified by university were mailed questionnaires.

A questionnaire and cover letter describing the purpose of the study and requesting cooperation were provided 4,722 students. Completed questionnaires

were returned by 3,263 students with a response rate of 76 percent for the 1862 and 53 percent for the 1890 students. Adjustments were made to allow the 1890 and 1862 respondents to be combined. This adjustment took into consideration both differential sampling and return rates for the 23 universities.[17/]

The resulting weighted regional sample consisted of 3,226 agriculture students. Among these students were 133 who reported a variety of majors unique to specific universities and not identifiable with agricultural education. These students were excluded from the sample for purposes of this report. The resulting weighted sample consisted of 3,093 agriculture students.

The adjusted sample included 245 students who indicated a major in pre-veterinary medicine and an additional 79 students who indicated pre-veterinary medicine as a second or dual major. All 324 students were enrolled in the school or college of agriculture at their university. The adjusted sample of 1862 and 1890 students also included 749 animal science majors.[c/] Together these two majors represented 35% of the sampled agriculture students from Southern land-grant universities.

I. Background Characteristics

The four types of characteristics presented here profile various aspects of the students' background in terms of personal characteristics, family origins, high school experiences and contacts with agriculture.

Comparisons are made between the pre-veterinary students and their animal science student counterparts with whom they interact most directly in the pursuit of their academic goals. The composite profile of the more heterogeneous grouping of all agriculture students is presented as a further point of reference with regards to the differences observed.

Personal Background

Selected characteristics of pre-veterinary students are presented in Table 1.[d/] As previously noted, throughout the past decade attention has been given to the increasing number of women seeking admission to the veterinary profession. This trend is especially visible at the undergraduate level as observed in the composition of pre-veterinary students. In this sample 42% were women, representing one of the highest proportions found in any agriculture curriculum. The appeal of animal related curricula held a strong attraction for female students, as their presence was extensive (33%) in animal science, as well.

- Table 1 here -

Pre-veterinary students in the South are drawn predominantly from the white segment of the population. Nonwhites represented only 12% of the students with black students accounting for 7% of these. Virtually all students were citizens of the U.S. (99%) as agriculture education generally tends to attract few foreign students (3%) at the undergraduate level.

Among agricultural students only about 1 in 8 is married (14%). Pre-veterinary students are even less likely (8%) to be married, reflecting their younger age. Whereas the number of agriculture and animal science students increases from a relatively small number in the freshman year (18%) to larger numbers in each class through the senior year (32%), the reverse pattern exists among pre-veterinary students because of deflection to other majors and admission to professional schools. In this Southern sample 31% of all pre-veterinary students were freshmen, 27% sophomores, 25% juniors and 17% seniors. The fact that many students in their senior year were still pursuing a pre-veterinary major rather clearly underlines the extent to which undergraduate counseling is needed along with a curricula that prepares students for multiple career options.[6/]

The kinds of places in which pre-veterinary students had lived most of their lives ranged from large cities to farms. Only a small proportion (16%) of pre-veterinary students grew up on a farm. They were somewhat less likely to come from a farm or rural area and more likely to come from a metropolitan center than were other agriculture students Nevertheless, the differences were small and the extent of urbanization among agriculture students generally was most distinctive.

Family Background

Characteristics of parents provide important information about students. This is particularly true for pre-veterinary students because of the heterogeneous residential backgrounds from which they come. The residence, education and occupation of a parent can well provide the link that helps explain in part the recruitment process that has led to pursuit of a pre-veterinary major. Table 2 presents comparative information describing both fathers and mothers.

- Table 2 here -

Parents' Childhood Residence. Only about 20% of the parents of pre-veterinary students had been reared on farms. Fathers were more likely to be farm-reared than were mothers (23% versus 19%). On the other hand, more than 1/4 had lived most of their childhood in urban areas of 10,000 population or larger. About half of the parents were reared in rural and small town environments. From the perspective of the parents' childhood, there is some affinity between a parent's rural upbringing and their child's selection of a pre-veterinary major. However, the pattern is not as pronounced as it is among other students majoring in agriculture curricula. Compared to animal science majors, the difference is 15% for fathers reared on farms and 10% for mothers.

Parents' Education. Fathers of pre-veterinary students were more likely to have completed college than were mothers by 18%. Almost 1/3 of the mothers

and 1/2 of the fathers had completed college. In both cases, parents of pre-veterinary students were better educated than were parents of students in other agriculture majors. These differences were not large. For fathers the difference was 7% more than that for fathers of animal science majors and only 3% more for mothers.

Parents' Occupation. Nonfarm managerial and professional occupations were the most common types held by fathers of agriculture students. Almost 2/3 (63%) of pre-veterinary fathers were in these types of occupations compared to 51% of animal science fathers. More significantly, few fathers of pre-veterinary students were inovlved in either agricultural production (8%, or any form of agribusiness-related occupation (4%). Fathers of animal science students were almost twice as likely to be in farming or agribusiness occupations. But even here less than 1/4 were agricultural in nature.

Occupational patterns among mothers seldom involved agricultural vocations directly. About half the mothers were of the traditional housewife-mother type with a similar proportion employed as wage earners. Mothers of pre-veterinary students differed little from mothers of other agriculture students in this regard. Among all employed mothers, approximately ½ had managerial or professional occupations.

Other occupationally related characteristics revealed that pre-veterinary students came from much the same kinds of family situations as animal science

and all agriculture students. Although 38% of pre-veterinary families had incomes above $25,000 in 1977, this proportion was only 3% higher than that for other students. Family income was much less likely to be derived primarily from farming. Only 21% were dependent on farming compared to 32% of agriculture students' families. At the same time, slightly more than 1/3 of the parents owned or rented a farm, but only 23% actually resided on a farm. Parents of animal science students were both more likely to own or rent a farm and to live on a farm than were parents of pre-veterinary students.

High School Background

Pre-veterinary students were more likely to have attended private high schools than were animal science students; however, the vast majority (83%) attended public high schools. Schools attended by almost 1/3 of the pre-veterinary students had fewer than 150 in the graduating class. But fewer pre-veterinary students attended small schools than was true for animal science and agriculture students. Clearly the more urban patterns among pre-veterinary students placed more of them in larger schools with greater potential for obtaining more varied educational opportunities in mathematics and science.

- Table 3 Here -

Self-reported grade-point averages revealed the academic selectivity that marks the pre-veterinary student. While slightly more than 1/4 of animal

science and agriculture students had been "A" students , more than 40% of pre-veterinary students reported "A" averages.

Many of the high schools attended by agriculture students did not offer courses in agriculture. Slightly fewer than half reported that agriculture courses were taught. The proportion of the pre-veterinary students reporting that the high school they had attended taught such courses was only 36%. As a result only 16% of pre-veterinary majors had completed at least one agriculture course as a part of their academic experience. By comparison, only 1/4 of the animal science and agriculture students completed an agriculture course(s), clearly indicating that this form of preparation was not particularly common among students entering an agriculture curriculum in college.

The high school environment offers a wide variety of extracurricular activities for students. Screening committees for graduate and professional schools place some weight on the student's record of such involvement. Table 4 shows the extent to which agriculture students participate in 14 types of high school related activities. Highlighting just a few of these in which pre-veterinary students are distinguishable from animal science and agriculture students reflects the greater academic orientation of these students. More than half (57%) were in band, chorus or drama groups, 63% in honorary organizations, 39% on school publications staffs, 59% in academic clubs, and

49% in student government. Each of these activities tends to be highly associated with more scholarly endeavors.

- Table 4 Here -

Some high schools also offer several agriculturally related extracurricular activities. Two such are 4-H and FFA clubs. High schools that do not offer courses in agriculture do often include 4-H clubs sponsored by the Cooperative Extension Service in their program. The same cannot be said for FFA which is closely identified with agriculture courses and the role of the agriculture teacher.

The first point to be made is that the vast majority of agriculture students in college today have not been exposed to these high school experiences. Only 25% reported participation in any one of these activities and less than 1/3 had either 4-H or FFA experience. Pre-veterinary students were less likely to have participated in these activities than animal science students. The difference was smallest (7%) for 4-H and 10% for FFA. Clearly, the majority of agriculture students and especially those in pre-veterinary medicine are not utilizing these agriculturally related activities for pre-socializing experiences to broaden their awareness of the occupational careers they are preparing to enter.

Agricultural Work Experiences

Since the majority of agriculture students do not have farm backgrounds, the acquisition of practical skills and knowledge of production practices is a concern for curriculum planners. The veterinary faculty are concerned too over the lack of interest students are showing in agriculturally related veterinary services.[5/] Often such interest is the direct result of prior work experiences, in this instance, experiences derived form work associated with agriculture. Table 5 considers three sources of agricultural work experiences that students might receive. These were work on the home farm or ranch, work as a hired farm or ranch hand, or work for some business serving the agriculture industry.

- Table 5 Here -

Almost half (48%) of all agriculture students had worked on a family-owned farm or ranch. Pre-veterinary students were least likely to have such experience and animal science students most likely. Still, 43% of the pre-veterinary students had received some exposure to farm or ranch work in this way.

Less than half the students had worked as farm or ranch hands. These proportions closely paralleled those having home farm or ranch experience. Are these the same students or does work as a hired hand represent an alternative source of agricultural expericene? By considering either home and/or

hired farm or ranch work experiences, it was found that 3/4 of all agriculture students had some type experience. Pre-veterinary students were less likely to have hired hand experience than animal science students. Comparatively, while 29% of pre-veterinary students lacked any kind of farm or ranch work experience, a similar 26% of agriculture students also lacked these experiences.

Although open to interpretation concerning the students' point of reference, more than half indicated that they had experience gained from other agriculture related work. Pre-veterinary students indicated such work experiences with the same frequency (58%) as did all agriculture students. These data do not reflect the duration or nature of this work. Nevertheless, it is clear that the majority of pre-veterinary students perceive themselves as having been involved in agricultural work at some time.

College Experiences

College years are critical to the young adult's career goals. This is especially true for students aspiring to a profession such as veterinary medicine. Several selected characteristics of the college experience reported in Table 6 revealed only small differences between pre-veterinary and agriculture students. Only 17% of pre-veterinary students attended a junior college prior to enrolling at their present university, and only 13% transferred from another college or university. These percentages were slightly higher among animal science and agriculture students.

- Table 6 Here -

Computing college academic performance on a 4-point scale with A equalling 4, pre-veterinary students had the best grade-point averages (GPA). More than half (59%) reported a GPA of B or above compared to 35% of animal science students. Also, far fewer pre-veterinary students (23%) had changed their major at least one time since beginning college. This contrasted sharply with animal science and agriculture students, half of whom had made one or more changes of major. One obvious reason for the lower incidence among pre-veterinary students is that a professional curriculum is most commonly the initial major from which many students deflect as a result of waning interest, academic difficulty or other assorted problems.

Extracurricular activities in college accumulate over the college years as each student develops his or her interests and reaches appropriate academic stages. Because these students represent freshmen through seniors, the proportions participating in the various activities are smaller than they would be if all students had completed their education. Nevertheless, these data provide a picture of the extent to which agriculture and pre-veterinary students participate in a variety of academically related college activities.

Pre-veterinary students are more likely to be members of a college honorary than are agriculture students. Interest in livestock manifesting itself in participation on a judging team occurs less often among

pre-veterinary students than among animal science students. Participation in a variety of other activities follows much the same pattern as among all agriculture students. The most common extracurricular activity (38%) involves departmental (subject matter) clubs. Only 10% or fewer agriculture students participate in college 4-H or FFA groups.

One important concern of many students is that of financing their college educations. How do most pre-veterinary students meet college costs? Three sources of funds providing all or part of the funds were used by 75% or more of these students. Parents are the most common source of funds. Only 11% indicated they received no financial help form their parents compared to 16% of all agriculture students. Similarly, only 20% reported that they did not earn some of their college funds on a summer job (23% of all agriculture students), and only 24% did not use personal savings (the same proportion as for all agriculture students).

Pre-veterinary students were somewhat less likely to work part- or full-time while attending college than were other agriculture students. This difference was 9%, but even here 45% did hold some type job while attending college. Pre-veterinary students were slightly more likely to receive scholarship funds than were other students. This is probably a direct result of their higher level of academic achievement both in high school and college. Less than 30% of all agriculture students used these sources.

II. Perceptions and Aspirations

In this section two types of subjective information about pre-veterinary and agriculture students are presented. The multitude of choices that individuals make during the course of their lives are influenced by many social contacts and personal experiences. One of these choices involves the decision about a college major. Other choice areas important at this point in life involve a number of adult goals such as the amount of education to get, where to live and the kind of occupation to seek. Obviously, these considerations are interrelated so that decisions relative to one goal influence the alternatives for realizing other goals. For this reason, these subjective orientations of students are of considerable interest.

Choice of College Major (Perceptions)

Influentials in Choice. In the search for insights into why college students choose the pre-veterinary major, attention was first given to the interpersonal dimension involving contacts with other people who were perceived as exerting influence on educational decisions. These interpersonal relationships may occur in four social contexts of particular importance--the family, high school, college and community. From each of these contexts several key status persons were identified. Each status represents a contact with the student that may be perceived as influential

either because of the intimacy of the personal relationship or because of the knowledge and prestige of the position this person occupies. Both types of influentials are considered here.

Table 7 indicates that the decision to major in pre-veterinary medicine is influenced by a wide variety of persons. As one would anticipate, parents (both fathers and mothers) were two of the most commonly acknowledged sources. This perceived influence of parents is most likely to emanate from the socialization experiences of the childhood and teenage years, as well as from the financial dependence of many students during college. The fact that pre-veterinary students were somewhat more likely to perceive their fathers (7%) and mothers (10%) as influencing this choice of major than was true for all agriculture students is probably due to the peculiar attraction that professional occupations hold for most parents.

- Table 7 Here -

Even more influential than the parents in the decision to major in pre-veterinary medicine was the local veterinarian. More than 3/4 of all majors attributed a veterinarian with influencing this choice, and almost half 48% indicated a "very" strong influence. In contrast, only 38% of the animal science majors attributed any influence on their choice of a major to contacts with a veterinarian. This finding clearly indicates the importance of the

veterinarian as a critical significant other role model in the recruitment of entrants for the profession.[3/]

No other category of persons was considered influential by a majority of students in the choice of major. Moreover, differences between pre-veterinary and other agriculture students were small relative to the remaining statuses considered. About 1/4 of all students perceived a relative other than a parent as influential in this choice but rarely (less than 8% of the time) was this seen as a strong influence.

Among the three remaining social contexts for significant other models, those involving high school and college contacts were most important. High school teachers, friends and counselors each represented sources of influence for some pre-veterinary students, but few students perceived this impact to be a strong one (6% or less). On the college scene about 1/3 of the students perceived a professor or advisor and friends as having influence. More students attributed a strong influence to these college contacts, especially to their professors or advisor (13%). The fact that more pre-veterinary students perceived influence from high school experiences while more agriculture students perceived influence from college experiences is probably a direct function of the larger proportion of pre-veterinary students who are in their freshmen and sophomore years.

Reasons for Choice. Why do students choose the pre-veterinary major? One reason--to prepare for a career as a veterinarian--is self-evident. When presented with a list of 13 potential reasons that might contribute to this choice and asked to rate each one as unimportant or as having some or much importance, virtually every student indicated a career consideration, Table 8. This was equally true of students in animal science. The vast majority of pre-veterinary students (81%) rated this reason "very" important.

- Table 8 Here -

Four other reasons were rated important by 1/2 or more of pre-veterinary students. In decending order these were: a desire to help others, a preference for country live, a desire to ensure a good income and a successful prior experience in agriculture. Agriculture students differed somewhat in that fewer of them emphasized helping ohters (74%), ensuring a good income (57%) and having had a successful experience in agriculture (49%). Special notation needs to be made of the importance attributed to this last reason. One-fourth of these pre-veterinary students rated their experiences in agriculture a "very" important reason for choosing this major.

The remaining reasons for choosing the major were considered important by 1/3 or fewer pre-vererinary students. In decending order, the next 4 reasons were completing a related college course, receiving a shcolarship or financial aid, encouraged by my family, and completing a related high

school course. Pre-veterinary, agriculture and animal science students differed only in the frequency with which they perceive the suggestion of a professor or college advisor (13%) influencing their choice. Again, this is probable due to the majority of pre-veterinary students being underclassmen with less time to have developed contacts with college faculty.

Adult Goals

Somewhat more than 1/3 of pre-veterinary students (39%) desired to live on a farm or ranch, Table 9. But twice as many (79%) expect to own a farm or ranch someday. How would this ownership come about? Almost half (47%) of those expecting to be farm or ranch owners indicatdd they expected to obtain ownership as the result of an inheritance. In light of the more urban, nonfarm backgrounds of these students, they might be expected to differ considerably from other agriculture students. This did not occur however, as only small differences were observed, and these occurred in contrast to animal science majors who were more likely to desire to live on a farm or ranch (8% more) and to expect to inherit a farm or ranch (4%).

- Table 9 Here -

Education represents another adult goal area. It is considered from two perspectives--aspirations (desires) and expectations. Since these are college students, the educational level attained is already high, allowing for relatively few alternatives. Beyond the bachelor's degree the primary

options are a professional or an academic degree (Master's or Doctorate). A very large majority (84%) but not all pre-veterinary students, desired a professional degree assumed to be in veterinary medicine compared to only about 1/4 of the animal science majors. In contrast, almost half the animal science and agriculture students (46%) desired academic degrees. Most significantly, if these students could have the level of education they would like to attain, 97% of the pre-veterinary and 69% of the animal science students would seek at least one degree beyond college.

Deflection from the desire to a potentially more realistic expectation is observed to occur among some students. It occurs more frequently among agriculture and animal science students than among pre-veterinary students. Deflection is observed with regards to both professional and academic degrees. Only 44% of animal science students really expected another degree beyond the bachelor's compared to 87% of pre-veterinary students. Again, the preponderance of underclassmen among the pre-veterinary students suggests part of the explanation for this lack of goal deflection. However, a second explanation may be the strength of the desire possessed by many pre-veterinary students to be a veterinarian.

When students expecting to do graduate work were asked whether they expected to remain at their present university, a majority (56%) indicated that they planned to do so. There was even less expectation of changing to

another university among pre-verteinary students (32%). As more 1862 land-grant universities in the South become involved with veterinary medical education the proportion of mobile students may decline even more. Certainly, these data suggest that opportunities for professional and academic education at a university may be a strong consideration in the selection of the undergraduate institution.

Upon completion of their education these students will be entering occupations. What kinds of incomes do they expect on the first job? Pre-veterinary students stood out compared to other agriculture students because of cheir higher income expectations. Overall, only a little more than 1/4 of agriculture students in 1977 expected to earn $12,500 or more on their first job while more than half the pre-veterinary students expected to begin at this level. Moreover, 19% of the pre-veterinary students expected incomes of $20,000 and above compared to only 5% of animal science students. The difference was the obviously higher income expectations of students seeking entrance into a profession.

Occupational goals are probably the primary concern of the college student. Table 10 presents information on both desired and expected occupational levels. A majority of these agriculture students (53%) desired professional type occupations. As would be anticipated, pre-veterinary students

were virtually all (91%) oriented to the professions. Almost 1/4 of the animal science majors desired farm or ranch operator/manager occupations.

- Table 10 Here -

Deflection from the desired occupation to the occupation actually expected was much more pronounced than it was for education among pre-veterinary students. The rate of deflection was 23% with only 2/3 actually expecting to attain their occupational goal. Since fewer animal science students were professionally oriented, their deflection was only 18%. However, the important insight is the failure of a sizeable number of students who did not expect to attain their occupational goal to have any kind of alternative occupation in mind. This points to the dilemma that many students encounter in college as they sample a number of different majors. Often they lack an occupational goal to which they can relate their curriculum choice. Moreover, this may be why upper level students who are not accepted to veterinary schools continue as pre-veterinary students. They, like many undergraduate students, have no clear conception of the world of work and of alternative occupations that would serve as a basis for identifying other curricula.

A second aspect of the occupational goal is concerned with whether the occupation is identified with agriculture. A classification scheme consisting of several hundred specific job titles categorized into some 50 types of activities was used. Table 11 shows three things. First, a large majority

of agriculture students (about 3/4) both desire and expect to enter occupations related to agriculture in its broadest sense. Second, agricultural production occupations as either a farm or ranch owner or manager are desired or expected by only about 20% of agriculture students. Third, pre-veterinary students are virtually all oriented to agricultural occupations through the definitional aspect of the veterinary profession's service to agricultural production. The strength of this identification with or commitment to production agriculture is subject to further exploration.

- Table 11 Here -

One way to determine the strength of a student's identification with a field such as agriculture is in terms of the assessments he/she makes of people in the field with whom the student has social contact. Therefore, one mechanism for assessing the strength of pre-veterinary students' orientations to agriculture is by virtue of their evaluation of their academic reference group--agriculture students.

Each student was asked to compare students enrolled in agriculture with nonagriculture students on eight descriptive characteristics. They were asked to rate their agriculture colleagues as "more, the same or less" than nonagriculture students on each comparative item. Ratings presented in Table 12 reflect only the larger of the "more" or "less" ratings for each

comparison. For every item the majority perceived agriculture students to be similar to or the same as nonagriculture students.

- Table 12 Here -

The majority of pre-veterinary and agriculture students perceived themselves to be more friendly and helpful to other people than nonagriculture students. A large proportion of pre-veterinary students saw their group as more sure of what they want to do in life, as more seriously concerned about the state of the nation and the world, and as less interested in making a lot of money. Regarding academic performance, 17% saw their fellow students in agriculture as less interested in competing for high grades.

Pre-veterinary students differed by only a few percentage points from the profile exhibited by all agriculture students. Although these differences were small (4% or less), they were consistently in the direction of agriculrure students holding a more positive image of agriculture students as a student body. Much the same pattern was observed in comparison to the animal science students with whom pre-veterinary students have a number of shared interests. These perceptions clearly indicate that the pre-veterinary student enrolled as an agriculture student at a land-grant university is very compatible with his or her fellow students in spite of different family backgrounds, personal experiences and occupational goals.

III. Attitudes

This section addresses two social value issues existing in contemporary American society that have direct relevance to changes occurring in the veterinary profession. One value concern centers around the role of women in veterinary medicine. Another is the value placed upon agriculture and the importance of this industry within the fabric of the total society. We have already documented the dramatic inroads that women are making into the veterinary profession.[6] At the same time there is a growing concern surfacing over the lack of interest in career lines servicing the various needs of the agricultural industry.[5] Both of these value issues are profiled here in terms of existing attitudes among pre-veterinary students.

The Woman's Role

Seven attitudinal indicators of various aspects of the woman's role relative to family and occupational career were used. Response categories for each indicator ranged over a 5-point scale from strongly agree to strongly disagree with the mid-point for undecided.

Table 13 presents the attitudinal profiles of students in the various curricula. There was virtually unanimous acceptance among pre-veterinary and all agriculture students of the idea that a woman doing the same work as a man should receive the same pay. Also, there was widespread acceptance of

the contention that women are capable of performing as well as men at work outside the home (61%) and that it's all right for women to work full-time even though their children are in school.(51%). All three of these attitudes are especially critical to the emerging value toward women in the work force.

- Table 13 Here -

Four other attitudes were expressed in a negative or restrictive fashion and were broadly disavowed by pre-veterinary students. Only 12% agreed with the idea that working in a situation where the supervisor was a woman would cause one to feel uncomfortable. Similarly, only 18% agreed with the idea that a woman in college is primarily concerned with getting a husband rather than preparing for a career. The negative attitude that woman should work full-time only until she has children was supported by only 24%. In this same vein, only 25% supported the idea that a woman can work, but her real fulfillment in life comes with motherhood. The educated women of today often take issue with these types of value perspectives. It is important that only a minority among pre-veterinary and all agriculture students endorsed traditional values relative to the role of women. On every attitude pre-veterinary students were most likely to hold a favorable orientation to the emerging role of women, probably because of the high proportion of women in this curriculum.

These profiles reveal the more widespread career value emphasis that pre-veterinary students have compared to less professionally oriented students.

A professional career represents a considerable investment of time and energy often perceived as providing a woman with potential for integrating both career and family values in a meaningful and satisfying way.

Image of Agriculture

The second value set considered is related to agriculture and the agricultural industry. Four attitudes were considered. The vast majority of pre-veterinary students held positive or favorable images of agriculture. In response to the posed idea that good career opportunities exist in agriculture 91% indicated agreement and 43% of these agreed strongly. Similarly, two negative attitudes elicited little agreement. Only 9% believed that work in agriculture can be done by people with little education and that agriculture is a declining industry. Indicative of the changing role of women specifically in agriculture was the small number of students (22%) who believed that most agricultural occupations are unsuited to women.

Attitudes of animal science and agriculture students reflected the same profile with regards to these concerns. Differences in the profiles of the various curricula groups was 6% or less for each attitude. Excluding their perception of agriculture as a declining industry, pre-veterinary students were more likely to hold a positive image of agriculture as offering good future prospects and career opportunities than were other agriculture students.

The presence of a positive attitudinal set and value orientation toward agriculture among pre-veterinary students at this point in the educational process gives rise to questions about what happens in their later veterinary training that causes students to turn away from veterinary careers associated with the agricultural industry. These data suggest that the answer may not lie in the students as much as in the soicalization that occurs during their professional training within the College of Veterinary Medicine. Quite possibly their lack of a strong agriculture backgroung may cause many to feel less adequately prepared for work in animal agriculture. Moreover, as the student becomes better socialized into the profession, one becomes aware that the income potentials of veterinarians in the agricultural sector are often lower than those in other sectors.

Conclusions

As a prelude to the presentation of this profile of pre-veterinary students, we attempted to establish the parameters of change in veterinary education. Certainly the southern United States is in the process of considerable change with the establishment of several new Colleges of Veterinary Medicine, a dynamic agricultural industry and a rapidly expanding and urbanizing population. The Sunbelt Region holds considerable potential for the veterinary profession.

Within this context we have provided a region-wide profile of the undergraduate pre-veterinary student. This profile has documented the increased number of women seeking admitance to the veterinary profession. At the same time it has revealed that pre-veterinary students hold attitudinal orientations reflecting broad acceptance of increased participation of women in the profession. Although some pre-veterinary students do maintain rather traditional attitudes, such views do not represent the predominant value orientations.

Another critical issue profiled here centers around the nonfarm and nonrural residential background of so many pre-veterinary students. Lack of farm and agricultural experience is a very common characteristic, supporting recent efforts to provide expanded experiential training related to production agriculture and the animal industry during pre-veterinary and veterinary programs. One suggestion might be that the professional preceptorship should include exposure to both agriculture and nonagriculture work roles.

A very small proportion of pre-veterinary students are black or other minority groups. In this sample, 7% were black and 3% were hispanic, in a region of the nation having heavy concentrations of both minorities. Although much has been done by individual professional schools, these results raise a question about the effectiveness of these efforts and whether more imaginative approaches need to be developed for attracting minority students into the profession.

These data clearly indicate that the vast majority of pre-veterinary students, regardless of their sex, residence or minority status possess largely positive attitudes toward agriculture and the agriculture industry. This value orientation is consistent with a revived realization in many sectors of the population that agriculture has an important role to play in assuring an ample food supply for domestic consumption and world trade. Attitudes within the United States have become more favorable toward agriculture and the many agribusiness related occupations. Such a shift is apparent among these pre-veterinary students and may indicate a renewed interest among young veterinarians in entering occupations serving this basic industry.

Pre-veterinary students are influenced in their choice of an occupation and an educational curriculum by their parents and by the local veterinarian. As fewer students have farm backgrounds and direct experience with a variety of animals, more attention needs to be given to the "recruitment" process. Local veterinarians need to be made aware of the critical role thay often play in a young person's decision to seek a career in the profession. The local practitioners may be the sole opportunity for a young person to obtain experiential learning outside a traditional classroom setting.

Seldom do educators have available to them primary data for a wide cross-section of students in their specialty. More specifically, we know of no other study that addresses the subjective goals of college students

majoring in agriculture and pre-veterinary medicine. In these changing times marked by a renewed awareness and concern for agriculture education, it is more important than ever that veterinary educators acquire a better understanding of this student clientele.

FOOTNOTES

[a] The terms 1862 and 1890 universities refer to the separate Morrill Acts that created agriculture schools for whites and blacks in 18 Southern and border states. The student populations served by these institutions continue to be along racial lines, although some integration of the student bodies is taking place.

[b] All thirteen 1862 and eleven 1890 insitituions providing agriculture education programs are included in this study. The 1890 insitituions are: Alabama A&M University, Alcorn State University (MS), University of Arkansas-Pine Bluff, Florida A&M University, Fort Valley State College (GA), Langston University (OK), North Carolina A&T University, Prairie View University (TX), Tuskegee Institute (AL) and Virginia State College. The 1862 institutions are the University of Arkansas-Fayetteville, Auburn University (AL), Clemson University (SC), University of Florida, University of Georgia, University of Kentucky, Louisiana State University, Mississippi State University, North Carolina State University-Raleigh, Oklahoma State University, University of Tennessee, Texas A&M University and Virginia Polytechnic Institute & State University.

[c] Animal Science majors include such identifications as General Animal Science, Animal Production, Dairy Science, Dairy Manufacturing and Poultry Science.

[d] No statistical tests of comparison are presented for percentage differences between the different curricula groupings because many of the percentages are selected cells from more complex crosstabulations. Statistical tests would be inappropriate without benefit of the full table. Since the sample size is large, our strategy of analysis was to compare percentage differences of 5 points or more to be substantively meaningful and less likely to be the result of measurement or sampling error.

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Table 1. Background Characteristics of Southern Pre-Veterinary, Animal Science and Agriculture Students

Personal characteristic	Curriculum		Agriculture students
	Pre-vet	Animal science	
	percent		
Female	41.8	32.9	27.5
Nonwhite	11.8	10.6	11.1
Foreign citizen	0.8	4.7	3.3
Married	8.3	11.9	13.6
Primary childhood residence:			
Farm	15.8	23.7	20.0
Rural nonfarm (less than 10,000)	20.7	19.3	22.7
Metro city (500,000 or more)	17.2	14.8	14.4
Weighted sample size	324	749	3,093

Table 2. Family Background of Southern Pre-Veterinary, Animal Science and Agriculture Students

Family background characteristic	Curriculum		Agriculture students
	Pre-vet	Animal science	
	percent		
Father's childhood residence:			
Reared on farm	22.6	37.2	33.2
Urban (10,000 or more)	25.0	23.8	22.1
Father's education:			
Less than high school graduate	10.0	15.0	15.1
College graduate	49.7	42.8	42.5
Father's occupation:			
Managerial or professional	63.1	51.1	52.2
Farm production	7.5	18.2	15.1
Ag. related nonproduction	4.0	4.0	5.6
Mother's childhood residence:			
Reared on farm	18.6	28.6	26.4
Urban (10,000 or more)	28.6	23.8	23.3
Mother's education:			
Less than high school graduate	8.2	10.3	10.9
College graduate	31.9	28.7	27.8
Mother's occupation			
Managerial or professional	25.4	23.7	23.2
Employed	52.4	49.1	48.7
Parents:			
Live on farm	23.3	30.3	25.3
Own or rent farm	34.2	42.7	38.5
Primary income from farm	20.9	30.7	31.9
Income below $15,000	24.6	29.0	30.6
Income above $25,000	37.7	34.7	34.5
Weighted sample size	324	749	3,093

Table 3. High School Background of Southern Pre-Veterinary, Animal Science and Agriculture Students

High school characteristics	Curriculum		Agriculture students
	Pre-vet	Animal science	
	percent		
Attended private high school	16.6	10.8	12.4
Attended small high school (fewer than 150 in class)	31.9	36.0	38.1
Graduated with A average	40.5	27.3	26.5
Completed agriculture course	16.3	25.4	24.1
Weighted sample size	324	749	3,093

Table 4. High School Extracurricular Activities of Southern Pre-Veterinary, Animal Science and Agriculture Students

Extracurricular Activities	Curriculum		Agriculture students
	Pre-vet	Animal science	
	percent		
Athletic teams	59.9	61.2	61.5
Intramural sports teams	55.1	50.4	50.1
Boosters clubs, cheerleader squads or drill teams	26.7	24.6	24.2
Band, chorus and drama groups	57.0	48.3	47.3
Hobby clubs	29.7	26.6	27.0
Honorary organizations	63.2	45.9	45.6
Publication staffs	39.1	32.5	33.9
Academic subject groups	58.7	50.2	49.1
Student government	48.8	37.2	40.6
4-H club	22.2	28.9	24.6
FFA club	17.6	27.1	24.5
(Either 4-H or FFA)	27.4	34.8	30.6
Vocational clubs	11.7	13.4	14.2
Weighted sample size	324	749	3,093

Table 5. Agricultural Work Experience of Southern Pre-Veterinary, Animal Science and Agriculture Students

Agricultural work experiences	Curriculum		Agriculture students
	Pre-vet	Animal science	
	percent		
On home farm or ranch	42.6	54.9	47.9
Hired labor (farm or ranch)	44.9	52.2	46.6
Either home farm or hired farm labor experience	71.3	75.7	74.0
Other agricultural work	58.0	54.4	58.6
Weighted sample size	324	749	3,093

Table 6. College Experiences of Southern Pre-Veterinary, Animal Science and Agriculture Students

College experiences	Curriculum		Agriculture students
	Pre-vet	Animal science	
	percent		
Transferred from:			
Junior college	17.1	19.3	18.1
Other college	14.5	17.2	17.5
College GPA--"B" or above	58.7	35.2	37.0
Changed major	22.5	49.9	50.4
College extramural activities:			
Departmental clubs	37.8	42.5	39.1
Professional association	20.8	21.4	19.7
Honorary organizations	25.7	18.2	17.5
Judging teams	11.7	18.3	13.1
4-H or FFA	8.1	9.7	10.2
Agriculture council	4.7	6.2	6.0
Sources of college funds*:			
Parents	88.9	83.6	83.8
Summer job	80.4	73.4	77.4
Personal savings	75.4	74.1	74.5
Part-time college job	44.6	52.4	53.5
Scholarships	32.7	29.7	28.0
Student loans or grants	27.0	26.5	27.8
Weignted sample size	324	749	3,093

*Includes all costs such as tuition, fees, books and living expenses.

Table 7. Persons Perceived as Influencing Choice of the College Major of Southern Pre-Veterinary, Animal Science and Agriculture Students

Interpersonal influences*	Curriculum		Agriculture students
	Pre-vet	Animal science	
	percent		
Family			
Father	72.2	66.5	65.6
Mother	71.3	64.4	61.5
Brother	26.3	23.3	23.4
Sister	22.7	16.1	18.1
Other relatives	30.4	29.2	29.8
High School			
School friends	29.1	25.1	26.5
School counselor	22.4	18.6	18.3
Vocational agriculture teacher	10.8	16.9	16.7
Other teachers or principal	33.0	23.7	23.1
College			
College friends	31.0	35.8	35.7
College teacher or advisor	34.3	38.2	37.5
Agriculture dean	12.0	11.1	12.7
College alumni	21.4	24.0	23.0
Professional Contacts			
Veterinarian	76.9	38.2	23.0
County extension agent	7.6	14.7	11.2
Clergyman	10.4	5.6	6.1
Weighted sample size	324	749	3,093

*Percent rating each interpersonal influence as either some influence or very influential.

Table 8. Reasons Perceived Important in Choice of Major by Southern Pre-Veterinary, Animal Science and Agriculture Students

Reasons for choice*	Curriculum		Agriculture students
	Pre-vet	Animal science	
	percent		
Preparation for a career	96.6	93.4	94.9
Preference for country life	79.7	82.5	77.7
Desire to help others	89.3	69.9	73.5
Insure a good income	76.2	48.7	57.3
Successful agricultural experiences	59.7	52.8	49.2
Related college course	32.6	31.8	31.5
College teacher or advisor suggested this major	12.6	22.9	21.3
Family thought this best major	22.8	21.3	20.3
Related high school course	19.3	18.4	20.0
Received scholarship or financial assistance	22.9	18.8	19.6
Better chance to make good grades	11.7	16.6	16.9
Friends were in this major	9.8	17.9	16.9
High school teacher or counselor suggested this major	11.6	12.8	12.9
Weighted sample size	324	749	3,093

*Percent rating each reason as either of some importance or very important.

Table 9. Goals and Expectations of Southern Pre-Veterinary, Animal Science and Agriculture Students

Goals and expectations	Curriculum		Agriculture students
	Pre-vet	Animal science	
	percent		
Desire to live on farm or ranch	38.7	46.9	38.3
Expect to own farm or ranch someday	79.3	79.3	71.6
Expect to inherit a farm or ranch *	(46.9)	(51.4)	(47.5)
Educational aspirations:			
Professional degree	83.9	23.7	21.0
Graduate degree	12.3	45.6	46.4
Educational expectation:			
Professional degree	75.7	9.5	13.4
Graduate degree	11.6	34.0	28.8
Expect to do post-graduate work at same university**	(68.3)	(59.0)	(56.3)
Expect first job incomes of $12,500 or more (1977)	52.3	27.3	27.9
Weighted sample size	324	749	3,093

*Percentage based on the number expecting to own a farm or ranch someday.
**Percentage indicating they expected to obtain post-graduate education.

Table 10. Desired and Expected Occupational Levels of Southern Pre-Veterinary, Animal Science and Agriculture Students

Occupational level	Desired occupation			Expected occupation		
	Curriculum		Agriculture students	Curriculum		Agriculture students
	Pre-vet	Animal science		Pre-vet	Animal science	
	percent					
Professional & technical	91.0	53.2	52.7	67.9	35.1	40.4
Nonfarm managers & administrators	1.4	9.0	15.6	2.5	12.7	17.3
Farm operators & managers	2.4	24.0	17.8	6.3	21.1	13.3
All other nonfarm	0.7	3.3	2.7	3.3	5.6	5.5
Not reported	4.5	10.6	11.2	20.0	25.5	23.6
Weighted sample size	324	749	3,093	324	749	3,093

Table 11. Desired and Expected Agricultural Occupations for Pre-Veterinary, Animal Science and Agriculture Students at Southern Land-Grant Universities

Agricultural occupations	Desired ag occupation			Expected ag occupation		
	Curriculum		Agriculture students	Curriculum		Agriculture students
	Pre-vet	Animal science		Pre-vet	Animal science	
	percent					
Production agriculture operators	3.1	23.3	18.1	7.8	21.6	14.8
Farm or ranch manager	0.0	4.9	2.4	1.2	8.6	3.4
Ornamental horticulture	0.0	0.0	7.0	1.5	0.4	7.9
Agricultural production services (includes veterinarian)	88.2	28.8	23.9	74.6	18.8	20.1
Agricultural supplies & mechanical services	0.0	1.6	1.8	0.5	2.6	3.1
Agricultural research	0.5	6.3	5.2	5.0	6.3	6.0
Agricultural education	0.0	3.9	3.4	0.6	5.0	3.5
Conservation and forestry	0.0	9.8	12.6	0.4	8.1	12.5
All other agriculture	0.4	6.6	3.2	0.5	8.1	3.2
Nonagriculture	7.8	14.8	22.4	8.0	20.5	25.7
Weighted sample size:	324	749	3,093	324	749	3,093